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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

10/533270

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference FP18378	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. PCT/AU2003/001198	International Filing Date (day/month/year) 12 September 2003	Priority Date (day/month/year) 31 October 2002
International Patent Classification (IPC) or national classification and IPC Int. Cl. ⁷ G05B 23/02, F25B 49/00, F24F 11/00, C02F 1/00		
Applicant HYDRO AUDITING SYSTEMS PTY LTD et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 22 sheet(s).

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 12 March 2004	Date of completion of the report 18 March 2004
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer ADRIAN GILLMORE Telephone No. (02) 6283 2125

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/AU2003/001198

I. Basis of the report**1. With regard to the elements of the international application:***

- ☐ the international application as originally filed.
- ☒ the description, pages 1, 8-19, as originally filed,
pages 2-7d, filed with the demand,
pages , received on with the letter of
- ☒ the claims, pages , as originally filed,
pages , as amended (together with any statement) under Article 19,
pages 20-31, filed with the demand,
pages , received on with the letter of
- ☒ the drawings, pages 1/4-4/4, as originally filed,
pages , filed with the demand,
pages , received on with the letter of
- ☐ the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims 1-43	YES
	Claims	NO
Inventive step (IS)	Claims 1-43	YES
	Claims	NO
Industrial applicability (IA)	Claims 1-43	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

D1: US 20020077777

D2: US 20020035403

D1 and D2 are considered to be the closest prior art. Claims 1, 10, 18, 29, 36, 38, 40, 42 define a monitoring and control system with a processor programmed with predetermined rules to determine if data needs to be transmitted to a centralised control station, and allowing the data to be transferred in bulk. D1-D2 do not disclose these features. Thus claims 1-43 are novel over D1-D2. In addition, it would not be obvious to extrapolate the teachings of D1-D2 to arrive at the features defined in claims 1-43. Thus, claims 1-43 are novel and inventive over D1-D2.

All claims are industrially applicable.

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Whilst some systems do provide ongoing monitoring, the problem with these systems is that the results of monitoring are not in a form which can be easily inspected and interpreted, and therefore considerable time may be
5 needed in analysis in order to determine whether a problem does exist. Obviously, once the analysis has been completed and the time period passed, the damage caused by the inappropriate conditions may have already occurred and not be reversible.

10

Thus, whilst testing may show that the water is suitable for the intended purpose, it may be that the characteristics of the water has changed significantly between measurement times, and whilst was within
15 satisfactory limits at the measurement times, was not at these levels during various periods between measurements. Thus, the water may have acquired characteristics which make the water unsuitable for discharge to the environment in the case of trade and industrial waste water plants, or
20 in which legionnaire can flourish in the case of air conditioning cooling towers.

Summary of the Invention

The object of the invention is to provide a monitoring
25 system which overcomes this problem.

The present invention provides a monitoring system for monitoring a fluid at a site, comprising:

at least one sensor for monitoring the fluid and
30 providing data indicative of a characteristic of the fluid;

a processor associated with the site for receiving the data from the sensor and for storing the data in a storage, the processor being programmed with predetermined
35 rules and being for applying the predetermined rules to determine if the data, and therefore the characteristic of the fluid, meets a predetermined criterion, and being for

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determining whether the data needs to be transmitted to a centralised control station;

5 a communication device for establishing a data transmission link between the processor and the centralised control station and for transmitting the data over the link so the data can be transmitted in bulk when the rules determine the data needs to be transmitted to the station;

10 a server and a data store at the centralised control station for receiving and storing the data for utilisation by a user over the Internet; and

an event indicator for providing an indication if the predetermined criterion is not met so remedial action can be taken.

15

The invention also provides a method of monitoring a fluid at a site, comprising the steps of:

monitoring the fluid with at least one sensor to provide data indicative of a characteristic of the fluid;

20 storing the data and processing the data at the site in accordance with predetermined rules to determine if the data, and therefore the characteristic of the fluid, meets a predetermined criterion, and for determining whether the data needs to be transmitted to a centralised control station;

25

establishing a data transmission link between the processor and the centralised control station and transmitting the data over the link so the data is transmitted in bulk when the rules establish the data needs to be transmitted to the station;

30

receiving the transmitted data with a server and a data store at the centralised control station so the data can be utilised by a user via the Internet; and

35 providing an event indication if the predetermined criterion is not met so remedial action can be taken.

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Thus, the present system provides continuous and real time monitoring so that in the event of the fluid characteristic falling outside the required criterion, an event indication can be immediately given so that remedial
5 action can be taken to correct the situation.

Preferably the event indicator comprises an alarm at the site which is activated under control of the processor if the predetermined criterion is not met.

10

Preferably the processor is also for, in the event of determining that the characteristic of the fluid does not meet a predetermined criterion, transmitting data via the link to the centralised control station, and the event
15 indicator also comprising a communication processor at the centralised control station for transmitting a message to an authorised person that the predetermined criterion has not been met.

20 Preferably the event indicator comprises an audible or visual alarm which is activated to indicate that the characteristic falls outside the predetermined criterion.

Preferably the message comprises a mobile telephone
25 message forwarded to a mobile telephone of the person or an SMS message forwarded to the mobile telephone, or an e-mail message.

Preferably the communication link comprises a mobile
30 telephone data communication link.

Preferably a plurality of sensors are provided for monitoring the fluid and providing a plurality of signals indicative of different characteristics of the fluid.

35

Preferably the fluid comprises waste water in a trade-industrial waste water plant, water within a cooling

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system of an air conditioning plant, or air within a refrigeration system.

Preferably the programmed rules provide that data is
5 transmitted in bulk when the storage is 80% full.

The invention also provides a monitoring system for a trade/industrial waste water plant which has a collection tank for collecting waste water, a mixing tank for
10 receiving the waste water from the collection tank and in which the pH of the waste water is adjusted, a settling tank for receiving the waste water from the mixing tank, the settling tank having a pump for pumping the waste water from the settling tank to drain, the system
15 comprising:

a sensor for measuring the pH level of the waste water in the mixing tank or the settling tank, and for providing data indicative of the pH level;

a processor at the plant for receiving the data from
20 the sensor and for storing the data in a storage, the processor being programmed with predetermined rules and being for applying the predetermined rules to determine if the data, and therefore the pH level, meets a predetermined criterion, and being for determining whether
25 the data needs to be transmitted to a centralised control station;

a communication device for establishing a data transmission link between the processor and the centralised control station and for transmitting the data
30 over the link so the data can be transmitted in bulk when the rules determine the data needs to be transmitted to the station;

a server and data store at the centralised control station for receiving and storing the data so the data can
35 be utilised by a user via the Internet; and

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an event indicator for providing an indication if the pH level does not meet the predetermined criterion so remedial action can be taken.

5 The invention also provides a method of monitoring a trade/industrial waste water plant which has a collection tank for collecting waste water, a mixing tank for receiving the waste water from the collection tank and in which the pH of the waste water is adjusted, a settling
10 tank for receiving the waste water from the mixing tank, the settling tank having a pump for pumping the waste water from the settling tank to drain, the method comprising the steps of:

measuring the pH level of the waste water in the
15 mixing tank or the settling tank with a sensor, and providing data indicative of the pH level;

storing the data and processing the data at the plant in accordance with predetermined rules to determine if the data, and therefore the pH level, meets a predetermined
20 criterion, and for determining whether the data needs to be transmitted to a centralised control station;

establishing a data transmission link between the processor and the centralised control station and transmitting the data over the link in bulk when the rules
25 determine the data needs to be transmitted to the station;

receiving the transmitted data with a server and data store at the centralised control station so the data can be utilised by a user via the Internet; and

providing an event indication if the pH level does
30 not meet the predetermined criterion so remedial action can be taken.

Preferably the system further comprises:

a sensor for measuring the water level in the
35 settling tank and for providing data indicative of the water level;

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a sensor for sensing flow from the pump and for providing data indicative of flow from the pump; and

wherein the processor receives the data from all the sensors to determine if the pH level, water level and flow
5 meet predetermined criteria so that data relating to all the sensors is able to be transmitted to the centralised control station by the transmission link for receipt by the server and data store, and so the event indicator can provide an indication if the predetermined criterion
10 relating to any one of the sensors is not met so remedial action can be taken.

Preferably the plant further comprises:

a reservoir for providing an acid solution to the
15 mixing tank;

a reservoir for providing an alkaline solution to the mixing tank; and

the system further comprises:

20 respective sensors for measuring the level of the solutions in the acid reservoir and alkaline reservoir and providing signals indicative of the levels;

the processor being for receiving the signals to determine whether the level of the acid solution and alkaline solution meets predetermined criteria; and

25 the event indicator providing an indication if the predetermined criteria are not met so that the reservoirs can be refilled if necessary.

30 Preferably a first sensor is provided for measuring the pH level in the mixing tank, and a second sensor is provided for measuring the pH level in the settling tank, each for providing respective data indicative of pH level for receipt by the processor.

35 Preferably the processor controls the pump so as to activate the pump to pump waste water from the settling

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tank when the water level in the settling tank reaches a predetermined level.

5 Preferably the system also includes a temperature sensor for measuring the temperature of the waste water in the settling tank.

10 Preferably the processor controls application of acid solution or alkaline solution to the mixing tank depending on the pH level of the water.

15 Preferably the rules implemented by the processor include one or more of the rules selected from the following group: the temperature of the waste water, the pH level of the waste water, whether the pump is operating, the flow rate of waste water discharge by the pump, whether the central controller has made contact with the remote monitoring processor via the communication link within a specified time period, and whether the remote monitoring processor is ready to download data to the central control station.

25 Preferably the event indicator provides an indication of the need to turn on or off the pump, replenish the acid solution or alkaline solution in the acid reservoir and alkaline reservoir, instigate a local alarm, transmit a message to the authorised person, and download data from the remote monitoring processor to the central controller.

30 Preferably data is transmitted in bulk when the storage is 80% full.

35 The invention also provides a monitoring system for cooling towers of an air conditioning system, the monitoring system comprising:

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a sensor for sensing the pH level of water in the cooling tower, and providing data indicative of the pH level;

5 a sensor for measuring the temperature of the water in the cooling tower, and providing data indicative of the temperature;

a sensor for measuring the conductivity of the water in the cooling tower, and providing data indicative of the conductivity;

10 a processor associated with towers for receiving the data from the sensors, storing the data in a storage, and for applying predetermined rules to determine whether the pH level, temperature and conductivity fall within prescribed limits, and for determining whether the data
15 needs to be forwarded to a centralised control station;

a communication device for establishing a data transmission link between the processor and the centralised control station and for transmitting the data over the link so the data can be transmitted in bulk when
20 the rules determine the data needs to be transmitted to the station;

a server and a data store at the centralised control station for receiving and storing the data for utilisation by a user via the Internet; and

25 an event indicator for providing an indication if the prescribed limits are not met so remedial action can be taken.

The invention also provides a method of monitoring cooling
30 towers of an air conditioning system, the method comprising:

sensing the pH level of water in the cooling tower, and providing data indicative of the pH level;

35 measuring the temperature of the water in the cooling tower, and providing data indicative of the temperature;

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measuring the conductivity of the water in the cooling tower, and providing data indicative of the conductivity;

5 storing and processing the data at the cooling towers in accordance with predetermined rules to determine whether the pH level, temperature and conductivity fall within prescribed limits, and for determining whether the data needs to be forwarded to a centralised control station;

10 establishing a data transmission link between the processor and the centralised control station and transmitting the data over the link so the data can be transmitted in bulk when the rules determine the data needs to be transmitted to the station;

15 receiving the transmitted data by a server and a data store at the centralised control station for utilisation by a user via the Internet; and

providing an indication event if the prescribed limits are not met so remedial action can be taken.

20 Preferably the data is transmitted in bulk when the storage is 80% full.

The invention also provides a monitoring system for
25 monitoring a refrigeration unit, the monitoring system comprising:

a sensor for sensing air temperature within the unit and providing data indicative of the air temperature;

30 a processor at the unit for receiving the data from the sensor and for storing the data, the processor being programmed with predetermined rules and being for applying the predetermined rules to determine if the data, and therefore the air temperature, meets a predetermined criterion, and being for determining whether the data
35 needs to be transmitted to a centralised control station;

a communication device for establishing a data transmission link between the processor and the

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centralised control station and for transmitting the data over the link so the data is transmitted in bulk when the rules determine the data needs to be transmitted to the station;

5 a server and a data store at the centralised control station for receiving and storing the data so the data can be utilised by a user via the Internet; and

an event indicator for providing an indication if the criteria is not met so remedial action can be taken.

10

The invention also provides a method of monitoring a refrigeration unit, the method comprising:

sensing air temperature within the unit and providing data indicative of the air temperature;

15 storing and processing at the unit the data in accordance with predetermined rules to determine if the data, and therefore the air temperature, meets a predetermined criterion, and for determining whether the data needs to be transmitted to a centralised control

20 station;

establishing a data transmission link between the processor and the centralised control station and transmitting the data over the link so the data is transmitted in bulk when the rules determine the data needs to be transmitted to the station;

25 receiving the transmitted data by a server and a data store at the centralised control station for so the data can be utilised by a user via the Internet; and

30 providing an event indication if the criteria is not met so remedial action can be taken.

Preferably the data is transmitted in bulk when the storage is 80% full.

Claims

1. A monitoring system for monitoring a fluid at a site, comprising:
- 5 at least one sensor for monitoring the fluid and providing data indicative of a characteristic of the fluid;
- 10 a processor associated with the site for receiving the data from the sensor and for storing the data in a storage, the processor being programmed with predetermined rules and being for applying the predetermined rules to determine if the data, and therefore the characteristic of the fluid, meets a predetermined criterion, and being for determining whether the data needs to be transmitted to a
- 15 centralised control station;
- a communication device for establishing a data transmission link between the processor and the centralised control station and for transmitting the data over the link so the data can be transmitted in bulk when
- 20 the rules determine the data needs to be transmitted to the station;
- a server and a data store at the centralised control station for receiving and storing the data for utilisation by a user over the Internet; and
- 25 an event indicator for providing an indication if the predetermined criterion is not met so remedial action can be taken.
2. The system of claim 1, wherein the event indicator
- 30 comprises an alarm at the site which is activated under control of the processor if the predetermined criterion is not met.
3. The system of claim 1 or claim 2, wherein the
- 35 processor is also for, in the event of determining that the characteristic of the fluid does not meet a predetermined criterion, transmitting data via the link to

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the centralised control station, and the event indicator also comprising a communication processor at the centralised control station for transmitting a message to an authorised person that the predetermined criterion has
5 not been met.

4. The system of claim 2, wherein the event indicator comprises an audible or visual alarm which is activated to indicate that the characteristic falls outside the
10 predetermined criterion.

5. The system of claim 3 wherein the message comprises a mobile telephone message forwarded to a mobile telephone of the person or an SMS message forwarded to the mobile
15 telephone, or an e-mail message.

6. The system of claim 1 wherein the communication link comprises a mobile telephone data communication link.

20 7. The system of claim 1 wherein a plurality of sensors are provided for monitoring the fluid and providing a plurality of signals indicative of different characteristics of the fluid.

25 8. The system of claim 1 wherein the fluid comprises waste water in a trade-industrial waste water plant, water within a cooling system of an air conditioning plant, or air within a refrigeration system.

30 9. The system of claim 1 wherein the programmed rules provide that data is transmitted in bulk when the storage is 80% full.

35 10. A method of monitoring a fluid at a site, comprising the steps of:

monitoring the fluid with at least one sensor to provide data indicative of a characteristic of the fluid;

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storing the data and processing the data at the site
in accordance with predetermined rules to determine if the
data, and therefore the characteristic of the fluid, meets
a predetermined criterion, and for determining whether the
5 data needs to be transmitted to a centralised control
station;

establishing a data transmission link between the
processor and the centralised control station and
transmitting the data over the link so the data is
10 transmitted in bulk when the rules determine the data
needs to be transmitted to the station;

receiving the transmitted data with a server and a
data store at the centralised control station so the data
can be utilised by a user via the Internet; and

15 providing an event indication if the predetermined
criterion is not met so remedial action can be taken.

11. The method of claim 10, wherein providing the event
indication comprises generating an alarm at the site which
20 is activated under control of the processor if the
predetermined criterion is not met.

12. The method of claim 10 or claim 11, wherein in the
event of determining that the predetermined criterion is
25 not met, data is transmitted via the transmission link to
the centralised control station, and the step of providing
an event indication comprises transmitting from the
centralised control system a message to an authorised
person that the predetermined criterion has not been met,
30 and further including the step of transmitting data via
the link to the centralised control station in the event
that the predetermined criterion is not met so the event
indication is immediately transmitted to the person.

35 13. The method of claim 12, wherein the message comprises
a mobile telephone message forwarded to a mobile telephone

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of the person or an SMS message forwarded to the mobile telephone, or an e-mail message.

14. The method of claim 10 wherein the communication link
5 comprises a mobile telephone data communication link.

15. The method of claim 10 wherein the fluid is monitored
by a plurality of sensors for providing a plurality of
signals indicative of different characteristics of the
10 fluid.

16. The method of claim 10 wherein the fluid comprises
waste water in a trade-industrial waste water plant, water
within a cooling system of an air conditioning plant, or
15 air within a refrigeration system.

17. The method of claim 10 wherein the program rules
provide that data is transmitted in bulk when a storage
containing the data is 80% full.

20 18. A monitoring system for a trade/industrial waste
water plant which has a collection tank for collecting
waste water, a mixing tank for receiving the waste water
from the collection tank and in which the pH of the waste
25 water is adjusted, a settling tank for receiving the waste
water from the mixing tank, the settling tank having a
pump for pumping the waste water from the settling tank to
drain, the system comprising:

30 a sensor for measuring the pH level of the waste
water in the mixing tank or the settling tank, and for
providing data indicative of the pH level;

a processor at the plant for receiving the data from
the sensor and for storing the data in a storage, the
processor being programmed with predetermined rules and
35 being for applying the predetermined rules to determine if
the data, and therefore the pH level, meets a
predetermined criterion, and being for determining whether

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the data needs to be transmitted to a centralised control station;

5 a communication device for establishing a data transmission link between the processor and the centralised control station and for transmitting the data over the link so the data can be transmitted in bulk when the rules determine the data needs to be transmitted to the station;

10 a server and data store at the centralised control station for receiving and storing the data so the data can be utilised by a user via the Internet; and

an event indicator for providing an indication if the pH level does not meet the predetermined criterion so remedial action can be taken.

15

19. The system of claim 18 further comprising:

a sensor for measuring the water level in the settling tank and for providing data indicative of the water level;

20

a sensor for sensing flow from the pump and for providing data indicative of flow from the pump; and

wherein the processor receives the data from all the sensors to determine if the pH level, water level and flow meet predetermined criteria so that data relating to all the sensors is able to be transmitted to the centralised control station by the transmission link for receipt by the server and data store, and so the event indicator can provide an indication if the predetermined criterion relating to any one of the sensors is not met so remedial action can be taken.

30

20. The system of claim 19 wherein the plant further comprises:

35 a reservoir for providing an acid solution to the mixing tank;

a reservoir for providing an alkaline solution to the mixing tank; and

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the system further comprises:

respective sensors for measuring the level of the solutions in the acid reservoir and alkaline reservoir and providing signals indicative of the levels;

5 the processor being for receiving the signals to determine whether the level of the acid solution and alkaline solution meets predetermined criteria; and

the event indicator providing an indication if the predetermined criteria are not met so that the reservoirs
10 can be refilled if necessary.

21. The system of claim 18 wherein a first sensor is provided for measuring the pH level in the mixing tank, and a second sensor is provided for measuring the pH level
15 in the settling tank, each for providing respective data indicative of pH level for receipt by the processor.

22. The system of claim 19 wherein the processor controls the pump so as to activate the pump to pump waste water
20 from the settling tank when the water level in the settling tank reaches a predetermined level.

23. The system of claim 20 wherein the system also includes a temperature sensor for measuring the
25 temperature of the waste water in the settling tank.

24. The system of claim 20 wherein the processor controls application of acid solution or alkaline solution to the mixing tank depending on the pH level of the water.
30

25. The system of claim 20 wherein the rules implemented by the processor include one or more of the rules selected from the following group: the temperature of the waste water, the pH level of the waste water, whether the pump
35 is operating, the flow rate of waste water discharge by the pump, whether the central controller has made contact with the remote monitoring processor via the communication

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link within a specified time period, and whether the remote monitoring processor is ready to download data to the central control station.

5 26. The system of claim 25 wherein the event indicator provides an indication of the need to turn on or off the pump, replenish the acid solution or alkaline solution in the acid reservoir and alkaline reservoir, instigate a local alarm, transmit a message to the authorised person,
10 and download data from the remote monitoring processor to the central controller.

27. The system of claim 18 wherein data is transmitted in bulk when the storage is 80% full.

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28. A method of monitoring a trade/industrial waste water plant which has a collection tank for collecting waste water, a mixing tank for receiving the waste water from the collection tank and in which the pH of the waste water
20 is adjusted, a settling tank for receiving the waste water from the mixing tank, the settling tank having a pump for pumping the waste water from the settling tank to drain, the method comprising the steps of:

measuring the pH level of the waste water in the
25 mixing tank or the settling tank with a sensor, and providing data indicative of the pH level;

storing the data and processing the data at the plant in accordance with predetermined rules to determine if the data, and therefore the pH level, meets a predetermined
30 criterion, and for determining whether the data needs to be transmitted to a centralised control station;

establishing a data transmission link between the processor and the centralised control station and transmitting the data over the link in bulk when the rules
35 determine the data needs to be transmitted to the station;

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receiving the transmitted data with a server and data store at the centralised control station so the data can be utilised by a user via the Internet; and

providing an event indication if the pH level does
5 not meet the predetermined criterion so remedial action can be taken.

29. The method of claim 28 further comprising:
measuring the water level in the settling tank and
10 for providing data indicative of the water level;
sensing flow from the pump and for providing data indicative of flow from the pump; and
processing the data from all the sensors to determine if the pH level, water level and flow meet predetermined
15 criteria so that data relating to all the sensors is able to be transmitted to the centralised control station by the transmission link for receipt by the server and data store, and so the event indication is provided if the predetermined criterion relating to any one of the sensors
20 is not met so remedial action can be taken.

30. The method of claim 29 wherein the plant further comprises:
a reservoir for providing an acid solution to the
25 mixing tank;
a reservoir for providing an alkaline solution to the mixing tank; and
the method further comprises:
measuring the level of the solutions in the acid
30 reservoir and alkaline reservoir and providing data indicative of the levels;
processing the data to determine whether the level of the acid solution and alkaline solution meets predetermined criteria; and
35 providing the event indication if the predetermined criteria are not met so that the reservoirs can be refilled if necessary.

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31. The method of claim 29 wherein the pump is activated to pump waste water from the settling tank when the water level in the settling tank reaches a predetermined level.

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32. The method of claim 30 further comprising measuring the temperature of the waste water in the settling tank.

33. The method of claim 30 further comprising controlling application of acid solution or alkaline solution to the mixing tank depending on the pH level of the water.

10

34. The method of claim 30 wherein the rules implemented by the processor include one or more of the rules selected from the following group: the temperature of the waste water, the pH level of the waste water, whether the pump is operating, the flow rate of waste water discharge by the pump, whether the central controller has made contact with the remote monitoring processor via the communication link within a specified time period, and whether the remote monitoring processor is ready to download data to the central control station.

15

20

35. The system of claim 34 wherein the event indicator provides an indication of the need to turn on or off the pump, replenish the acid solution or alkaline solution in the acid reservoir and alkaline reservoir, instigate a local alarm, transmit a message to the authorised person, and download data from the remote monitoring processor to the central controller.

25

30

36. A monitoring system for cooling towers of an air conditioning system, the monitoring system comprising:
a sensor for sensing the pH level of water in the cooling tower, and providing data indicative of the pH level;

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a sensor for measuring the temperature of the water in the cooling tower, and providing data indicative of the temperature;

5 a sensor for measuring the conductivity of the water in the cooling tower, and providing data indicative of the conductivity;

10 a processor associated with towers for receiving the data from the sensors, storing the data in a storage, and for applying predetermined rules to determine whether the pH level, temperature and conductivity fall within prescribed limits, and for determining whether the data needs to be forwarded to a centralised control station;

15 a communication device for establishing a data transmission link between the processor and the centralised control station and for transmitting the data over the link so the data can be transmitted in bulk when the rules determine the data needs to be transmitted to the station;

20 a server and a data store at the centralised control station for receiving and storing the data for utilisation by a user via the Internet; and

an event indicator for providing an indication if the prescribed limits are not met so remedial action can be taken.

25

37. The system of claim 36 wherein the data is transmitted in bulk when the storage is 80% full.

30 38. A method of monitoring cooling towers of an air conditioning system, the method comprising:

sensing the pH level of water in the cooling tower, and providing data indicative of the pH level;

measuring the temperature of the water in the cooling tower, and providing data indicative of the temperature;

35 measuring the conductivity of the water in the cooling tower, and providing data indicative of the conductivity;

- 30 -

storing and processing the data at the cooling towers
in accordance with predetermined rules to determine
whether the pH level, temperature and conductivity fall
within prescribed limits, and for determining whether the
5 data needs to be forwarded to a centralised control
station;

establishing a data transmission link between the
processor and the centralised control station and
transmitting the data over the link so the data can be
10 transmitted in bulk when the rules determine the data
needs to be transmitted to the station;

receiving the transmitted data by a server and a data
store at the centralised control station for utilisation
by a user via the Internet; and

15 providing an indication event if the prescribed
limits are not met so remedial action can be taken.

39. The method of claim 38 wherein the data is
transmitted in bulk when the storage containing the data
20 is 80% full.

40. A monitoring system for monitoring a refrigeration
unit, the monitoring system comprising:

a sensor for sensing air temperature within the unit
25 and providing data indicative of the air temperature;

a processor at the unit for receiving the data from
the sensor and for storing the data, the processor being
programmed with predetermined rules and being for applying
the predetermined rules to determine if the data, and
30 therefore the air temperature, meets a predetermined
criterion, and being for determining whether the data
needs to be transmitted to a centralised control station;

a communication device for establishing a data
transmission link between the processor and the
35 centralised control station and for transmitting the data
over the link so the data is transmitted in bulk when the

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rules determine the data needs to be transmitted to the station;

a server and a data store at the centralised control station for receiving and storing the data so the data can
5 be utilised by a user via the Internet; and

an event indicator for providing an indication if the criteria is not met so remedial action can be taken.

41. The monitoring system of claim 40 wherein the data is
10 transmitted in bulk when the storage is 80% full.

42. A method of monitoring a refrigeration unit, the method comprising:

sensing air temperature within the unit and providing
15 data indicative of the air temperature;

storing and processing at the unit the data in accordance with predetermined rules to determine if the data, and therefore the air temperature, meets a predetermined criterion, and for determining whether the
20 data needs to be transmitted to a centralised control station;

establishing a data transmission link between the processor and the centralised control station and transmitting the data over the link so the data is
25 transmitted in bulk when the rules determine the data needs to be transmitted to the station;

receiving the transmitted data by a server and a data store at the centralised control station for so the data can be utilised by a user via the Internet; and

30 providing an event indication if the criteria is not met so remedial action can be taken.

43. The method according to claim 42 wherein the data is transmitted in bulk when the storage containing the data
35 is 80% full.